ETHEOSTOMA COLLETTEI, A NEW DARTER OF THE SUBGENUS *OLIGOCEPHALUS* FROM LOUISIANA AND ARKANSAS[1]

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ABSTRACT

Etheostoma (*Oligocephalus*) **collettei** is described from 308 specimens from the Ouachita River drainage in Louisiana and Arkansas and the Little, Red and Sabine river drainages of Louisiana. *Etheostoma collettei* appears to be most closely related to *E. asprigene* from which it is differentiated primarily by color pattern.

A new species of the subgenus *Oligocephalus*, herein described, is well represented in collections from Louisiana and Arkansas, but has previously been confused with *E. asprigene* (Forbes). John D. Black and Carl L. Hubbs, in their studies of Arkansas fishes during the early 1940's, recognized this undescribed form and regarded it as a subspecies of *E. asprigene*.

The new species is known from the Ouachita River in Louisiana and Arkansas and from the Little, Red and Sabine river drainages of Louisiana. It probably occurs in the Calcasieu River drainage, but no collections from this drainage have been examined.

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Measurements and counts were made following Hubbs and Lagler (1958:8–15) except where otherwise indicated.

It is our pleasure to name this new darter for Bruce B. Collette, Bureau of Commercial Fisheries Systematics Laboratory, in recognition of his contributions to our knowledge of percid fishes.

Etheostoma (*Oligocephalus*) **collettei**, new species

Creole Darter
(Fig. 1)

Material. The description is based on 308 specimens from Louisiana and Arkansas. Holotype, USNM 201515 (♂ 56.3 milli-

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meters in standard length), Dugdemona River (Little River drainage), T15N, R3W, Section 6, Jackson Parish, La., 12 December 1966, Neil H. Douglas and Jacob P. Yelverton. Paratopotypes, USNM 201516 (38, 29.9-58.1).

Lower Ouachita River paratypes: NLSC 6317 (20, 29.9-52.9), Choudrant Bayou at La. Hwy. 15 bridge, Ouachita Parish, La., 29 September 1966, Douglas, K. Burnside, and H. Stegall; Univ. Ala. 2575 (17, 28.8-33.7), same data as NLSC 6317; CU 52108 (7, 40.8-61.5), Meridian Cr. on La. Hwy. 348, 1 mi. E. of Conway, Union Parish, La., T22N, R1W, Section 17, 12 November 1966, Douglas, Burnside and Yelverton; Tulane Univ. uncat. (10, 41.7-51.3), same data as CU 52108 (specimens apparently lost in transit); FSU 14678 (7, 40.5-60.0), Meridian Cr., T22N, R1E, Section 21, Union Parish, La., 15 June 1965, Douglas; USNM 172913 (14, 23.6-53.8), Meridian Cr., 1 mi. E of Conway, T22N, R1E, Section 17, Union Parish, La., 22 June 1965, Taylor; USNM 201517 (2, 51.9-52.1), Corney Lake Spillway, Claiborne Parish, La., W. Harman and H. Hobbs; USNM 172538 (4, 40.1-54.6), Little Corney Bayou at La. Hwy. 15, T22N, R3W, Section 1, Union Parish, La., Taylor; TU 52876 (5, 44.9-54.8), Meridian Cr., 1 mi. E of Conway, T22N, R1E, Section 17, Union Parish, La., 21 May 1956, Taylor and Lowe.

Upper Ouachita River paratypes: CU 42248 (71, 26.7-49.2), Middle Fork, Saline R. about 6 mi. W of Crows, Saline Co., Ark., 27 April 1962, Knapp and R. V. Miller; USNM 165915 (52, 25.5-48.5), South Fork, Saline R., 7.7 mi. SSW of Owensville, Garland Co., Ark., 22 April 1952, Lachner et al.; UMMZ 123229 (2, 30.0-31.9), Gulpha Cr. at jct. with Lake Hamilton, 10 mi. E of Hot Springs, Garland Co., Ark., 19 June 1938, J. and R. Black; USNM 165953 (9, 36.6-42.9), Antoine Cr., Trib. of Little Missouri R., 2.5 mi. N of Kirby, Pike Co., Ark., 21 April 1952, Lachner et al.

Little River paratypes: FSU 14676 (23, 35.3-45.6), Little Cr., T5N, R1E, Section 28, Rapides Parish, La., 21 June 1965, Douglas.

Red River paratypes: UMMZ 113734 (20, 36.9-50.6), ½ mi. S of Dry Prong, Grant Parish, La., 29 May 1932, Creaser, Hedrick and Amell.

Sabine River paratypes: FSU 14677 (8, 36.0-47.5), Sandy Cr. on La. Hwy. 11, T2N, R11W, Section 20, Vernon Parish, La., 24 June 1965, Douglas.

Comparisons with *Etheostoma asprigene* were based primarily on the following material from the Ouachita River drainage: USNM 173058 (20, 28.2-35.6); USNM 172482 (4, 19.2-25.7); USNM 172759 (2, 48.3-49.5); USNM 172571 (1, 55.2); USNM 172296 (16, 32.1-43.4); UK 3527 (1, 35.5); UMMZ 169795 (3, 34.3-41.9).

Diagnosis. Distinguished from other members of the subgenus *Oligocephalus* by a combination of the following characters: dorsum with 3 or 4 prominent, dark blotches and 4 or 5 less conspicuous blotches; usually a prepectoral dark blotch; humeral spot pronounced; a dusky bar on body beneath pectoral fin; darkly pigmented scale centers contribute to the formation of horizontal lines on the body that tend to disappear ventrally about 4-5 scale rows below the lateral line; anal spines 2; belly scale edges thickened as tubercles in a few male specimens; prepectoral area and breast naked; cheeks, opercles, nape and belly with scales; eye ovoid and breaks the dorsal outline in profile; branchiostegal membranes slightly joined to overlapping; lateral line nearly straight and incomplete (Table 2), 28-46 (usually 32-42) pored scales, 3-21 (usually 8-18) unpored scales, 44-60 (usually 47-52) total scales; pectoral fin rays modally 13; coronal pore single; infraorbital canal complete, with 8 pores; preoperculomandibular canal with 10 pores; supratemporal canal usually complete in adults; snout blunt, slightly decurved; urogenital papilla moderately long in spawning females.

Description. Etheostoma collettei is a large, robust species of *Oligocephalus* (Fig. 1). The largest specimen examined is a male 61.5 mm SL. Table 1 gives the proportional measurements for the holotype and nine paratopotypes.

A moderately developed nuchal hump is present in both sexes, slightly more pronounced in males larger than 40 mm SL; the body is deepest at origin of spinous dorsal; the rostral frenum is well developed.

The body, including nape and belly, is completely covered with scales in most specimens; however, in some (including holotype) the scales of anterior ¼ to ½ of belly

are partially to entirely embedded. The nape is nearly naked to fully covered with embedded scales; breast and prepectoral areas are naked (latter with a few embedded scales in large individuals); the opercle is fully invested with large, wholly to partially exposed scales; approximately 50 per cent of the cheek below and behind eye with small, partially exposed scales.

Scales below lateral line 7-12 (usually 8-10); transverse scale rows 11-16 (usually 13-15); scales around caudal peduncle 18-24 (usually 19-22).

Vertebrae in 27 individuals from type-series: 36 (10 including the holotype), 37(15), 38(2). Palatine and vomerine teeth present.

Dorsal spines number 8-12 (usually 10-11); dorsal soft rays 11-14 (usually 12-13); anal fin with two spines and 6-8 (usually 7) soft rays. Pectoral rays (left side only) 11-14 (usually 12-14).

The shape of the spinous dorsal is variable but it is usually low and little rounded; the soft dorsal is somewhat larger than the anal fin, especially in large specimens; the posterior edge of the caudal fin is truncate.

Coloration of males. Color descriptions are based on observations made by Knapp and on two Kodachrome transparencies provided by Neil H. Douglas of a specimen approximately 55 mm SL, collected 29 June 1966, from Flem Branch (Little River drainage), Grant Parish, La., and a specimen about 65 mm SL taken 15 October 1966, from Choudrant Cr. (Ouachita River drainage), Ouachita Parish, La.

The 8-9 bluish-brown blotches on the dorsum are a distinctive feature of the color pattern. The second, fifth, seventh, and eighth are often more pronounced than the others. The location and relative prominence of the blotches are as follows: 1—nape just behind the head, often faint or absent; 2—nape just anterior to the spinous dorsal fin, pronounced; 3 and 4—below the spinous dorsal, faint; 5—below the posterior end of the spinous dorsal, pronounced; 6—below

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Figure 1. *Ethcostoma collettei*, new species. Drawn from the holotype, USNM 201515, a male, 56.3 mm in standard length, collected in the Dugdemona River, Little River drainage, Jackson Parish, Louisiana.

Table 1
Proportional measurements of *Etheostoma collettei*, expressed in hundredths of standard length.

Character	USNM 201515 Holotype (♂)	USNM 201516 Paratypes 4 ♂♂ Range	4 ♂♂ Mean[1]	5 ♀♀ Range	5 ♀♀ Mean
Standard length (mm)	56.3	46.8–53.1	51.1	41.5–58.1	49.1
Predorsal length	35	35–36	35.4	34–36	35.2
Body depth	23	18–20	20.0	18–21	19.4
Caudal peduncle length	19	17–19	18.4	16–18	17.4
Caudal peduncle depth	10	9–10	9.4	9–10	9.2
Head length	30	29–30	29.8	28–30	29.2
Head depth at orbit	12	12–13	12.2	11–13	12.4
Orbit width (vertical)	6	6	6.0	5–6	5.6
Orbit width (horizontal)	7	6–7	6.8	7	7.0
Snout length	6	6–7	6.4	6–7	6.4
Upper jaw length	8	8–9	8.2	8–9	8.4
Width of gape	9	7–9	8.6	7–8	7.8
Spinous dorsal base	30	27–31	29.4	28–31	28.8
Soft dorsal base	20	19–21	19.6	18–20	19.4
Anal base	14	12–14	13.0	10–13	11.6
Longest dorsal spine	12	11–13	12.0	11–13	11.6
Longest dorsal soft ray	16	13–16	14.8	13–15	14.4
Longest anal ray	15	14–16	15.0	14–15	14.8
First anal spine	9	9–12	9.6	7–9	8.0
Caudal fin length	18	18–20	18.6	18–20	18.8
Pectoral fin length	24	22–24	23.0	22–24	23.4
Pelvic fin length	20	17–20	18.8	18–20	18.8
Interpelvic distance	2	2	2.0	2	2.0
Transpelvic distance	8	8	8.0	7–9	8.0

[1] Holotype included in mean for males.

the origin of the soft dorsal, faint; 7—below the mid soft dorsal, pronounced in some specimens but faint in others; 8—just behind the soft dorsal, pronounced; 9—midway the dorsal surface of the caudal peduncle, faint and sometimes absent.

Most specimens have 5-8 vague, vertical bars on the posterior half of the body. These bars have a bluish cast in life but appear brown in preserved specimens. The area between the bars, the ventral surface of the caudal peduncle, and the belly are bright orange. The belly of most preserved male specimens is dusky.

A poorly-defined, brown, basicaudal blotch is discontinuous with a small distinctive spot lying just below the dorsal procurrent rays of the caudal fin. A similar spot is present above the ventral procurrent rays of the caudal fin in small specimens but apparently is obscured in larger specimens by being joined to the larger caudal blotch. Posterior to the caudal blotch at the base of the caudal rays, two roundish, orange spots lie just above and below the center of the caudal base.

The axil of the pectoral fin is densely pigmented with melanophores but characteristically has a bright orange bar. Posterior to the pectoral axis, a darkened bar of small melanophores begins immediately below the lateral line and extends ventrad to just behind the pelvic base. This bar is variable, but it is evident in most specimens. The breast of adult males is often covered with micromelanophores; however, some large adult males have few melanophores on the breast and in several specimens the breast is immaculate. The Choudrant Creek specimen in the Kodachrome transparency has a tinge of orange on the breast.

The prepectoral area, tinged with orange in life, often has a dark blotch. Pigmentation of the urogenital papilla varies, but usually a few lateral melanophores are present.

On the head there is a dark, well-defined subocular bar and a short, broad, postocular

TABLE 2
Lateral-line scale counts in *Etheostoma collettei* and *E. asprigene*

Species and Drainage	Total Lateral Line Scales																	N	x̄
	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58–60				
E. collettei																			
Upper Ouachita R.			3	2	6	13	14	22	16	11	7	8	1	1	1	1		106	51.3
Lower Ouachita R.	1	1	6	12	14	11	7	11	4	3	–	2						72	49.0
Little R.			1	5	7	9	13*	8	6	5	4	4						62	50.5
Red R.					2	2	3	3	3	3	2	1	–	1				20	51.6
Sabine R.						1	4	1	2									8	50.5
E. asprigene																			
Ouachita R.	2	1	1	3	7	10	8	8	1	2	1							44	49.2

Lateral-line scale counts in *Etheostoma collettei* and *E. asprigene*

Species and Drainage	Pored Lateral Line Scales																			N	x̄
	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46		
E. collettei																					
Upper Ouachita R.	2	3	2	2	10	10	12	10	20	14	7	8	5	2						107	35.2
Lower Ouachita R.				2	–	3	1	5	8	18	4	8	8	6	4	1	4			72	38.1
Little R.						1	2	7	8	6	10	3	10	6	5*	1	2	1		62	38.5
Red R.						1	–	–	2	3	2	6	2	2	–	–	–	–	2	20	39.0
Sabine R.		1	–	–	–	–	1	–	–	4	–	1	–	–	–	1				8	36.6
E. asprigene																					
Ouachita R.				1	–	–	4	2	4	7	3	6	3	5	2	2				39	38.0

Lateral-line scale counts in *Etheostoma collettei* and *E. asprigene*

Species and Drainage	Unpored Lateral Line Scales																			N	x̄
	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21		
E. collettei																					
Upper Ouachita R.[1]									3	2	11	13	23	13	14	9	9	5	1	103	16.0
Lower Ouachita R.	1	–	–	2	5	7	10	4	12	9	10	6	4	1	1					72	10.9
Little R.						5*	3	10	11	10	5	11	5	2						62	11.8
Red R.						2	–	–	2	4	5	4	3							20	12.6
Sabine R.					1	–	–	–	1	1	1	–	2	–	1	–	–	–	1	8	13.9
E. asprigene																					
Ouachita R.					1	4	5	6	5	10	2	4	–	–	1	–	1			39	11.2

[1] Includes one specimen with 31 unpored scales.
* Includes count for holotype.

blotch which does not extend to the preopercular margin. A diffuse, dark stripe from the anterior edge of the orbit to the upper lip gives the effect, when viewed from above, of a pale stripe through the frenum. A small dark spot on the dorsal part of the orbit extends onto the eye. A thin line of concentrated melanophores is present along the mandibular and maxillary grooves. The opercle is darkly pigmented as is the posterior edge of the preopercle. The branchiostegal membranes are also heavily pigmented and tinged with red-orange where they overlie the prepectoral area. The humeral spot is dark and well defined but is not enlarged.

The spinous dorsal fin membrane has a narrow, dark, marginal band which appears to have a greenish-blue cast. Beneath the distal band is a broad, vivid, red-orange band followed by a narrower dark band. Along the base of the spinous dorsal fin is a very narrow, dusky-orange band. The pig-

Table 3
Comparison of *Etheostoma collettei* and *E. asprigene* from the Ouachita River drainage of Louisiana.

Character	*E. collettei*	*E. asprigene*
Blotches on dorsum	8–9, 4 pronounced	8–9, all equally developed
Eye shape	Ovoid	Round
Snout shape	Slightly decurved, blunt	Produced, acute
Body bars	5–7, indistinct above L. L.	6–8, distinct above L. L.
Postpectoral bar	Well-developed	Absent or faint
Spinous dorsal	Wide orange-red band, narrow medial dark band	Narrow orange-red band; wide medial dark band
Humeral spot	Pronounced	Absent or faint
Postocular stripe	Short, broad; not reaching operculum	Long, narrow; reaching operculum
Prepectoral area	Naked	Partially exposed ctenoid scales
Pectoral rays	11–14, modally 13	12–15, modally 14

mentation of all three bands is restricted to the membranous portion of the fin and does not go across the rays.

The soft dorsal membrane has a dark, distal band similar to that of the spinous dorsal. Beneath the distal band is a broad, red-orange band which is dissected by the dusky rays. The base of the soft dorsal is marked by one, sometimes two, poorly-defined dark bands. The anal fin is greenish-blue along its base. Preserved specimens usually show an even gradation from a dark base to a light distal margin. In large preserved specimens the entire anal fin is often dark. The caudal fin membrane has 5-7 poorly defined dusky bars and, in larger specimens, a dusky distal margin. The interradial membranes of the pelvic fins in large specimens are densely covered with micromelanophores. The anterior interradial membrane is tinged with orange and the proximal portion of the other membranes is bluish-green. The pectoral fin displays several poorly-defined bars which are often obscure or absent. In life the proximal half of the pectoral fin is tinged with orange.

Coloration of females. The following account is based on preserved specimens. In general, the females are similar to the males, but, they differ in several subtle pigmentary features. The body above the lateral line is usually mottled. The vertical bars are less well defined than in the male. There are few, if any, micromelanophores on the venter, making the pattern more highly contrasted than in the male. The urogenital papilla is immaculate. The mandibular groove is more heavily pigmented and the branchiostegal membranes somewhat less pigmented in the female than in the male. The membranes of the soft dorsal are marked by 5 or 6 narrow dark bands. The anal and pelvic fins have little or no dark pigment.

Habitat. Neil H. Douglas (pers. comm.) has kindly provided the following notes on the habitat at the type-locality in the Dugdemona River in Jackson Parish, La. "This area is near the headwaters of the river, where the depth is normally two inches to three feet, with a width of 10-20 feet. The shore line is heavily vegetated. The stream flows with moderate to fast current at this point, and many logs and cypress stumps create riffle areas. The bottom is of hard soil with no rocks or gravel." Douglas further stated that the habitat at the type-locality is common in north central Louisiana, and that he has collected *E. collettei* throughout this area in streams with moderately strong current.

In the Saline River of the upper Ouachita drainage, one of us (Knapp) has taken *E. collettei* in several habitats. Near Crows, Arkansas, it was taken from heavy growths of *Podostemum ceratophyllum* in rocky chutes along with *E. blennioides* Rafinesque and *E. zonale* (Cope). In other areas of the Saline River, it was taken from clear gravel riffles with *E. whipplii* (Girard).

Relationships. In some features *Etheostoma collettei* appears very similar to *E. asprigene;* however, a number of obvious differences exist (Table 3). Breeding tubercles, similar in type and arrangement to those described by Collette (1966:597) for

E. caeruleum Storer, have been found in a few males. The rather elongate urogenital papilla of the ripe female is quite unlike that of *E. asprigene* and may be an adaptation for deposition of eggs on aquatic vegetation. In view of these dissimilarities, we do not feel that *E. collettei* can be placed in the *E. asprigene* species group as visualized by Ramsey and Suttkus (1965:74), but believe that it is more closely related to the *asprigene* group than to other groups in *Oligocephalus*.

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